



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/744,363	02/21/2001	Shinji Nakahara	01017/LH	4454

7590 01/31/2003

Frishauf Holtz Goodman
Langer & Chick
25th Floor
767 Third Avenue
New York, NY 10017-2023

EXAMINER

MOORE, KARLA A

ART UNIT	PAPER NUMBER
----------	--------------

1763

DATE MAILED: 01/31/2003

10

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/744,363

Applicant(s)

NAKAHARA ET AL.

Examiner

Karla Moore

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

Art Unit: 1763

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent Publication No. 06-267855 to Suzuki in view of Japanese Patent No. 19-129553 A to Minagawa and in view of U.S. Patent No. 5,094,885 to Selbrede.

3. Suzuki discloses an epitaxial growth furnace comprising: a sealed chamber (Figure 3, 65); and a pair of wafer holders for holding a pair of semiconductor wafers within said chamber; wherein formation of an epitaxial layer on a surface of each of said wafers is effected by supplying under a high temperature condition a source gas (66, see abstract) to a surface area of said wafers; wherein said surface areas are subject to epitaxial growth from within said reaction chamber; and wherein each of said holders comprises: an opening for exposing one of said surface areas of the wafers to said reaction chamber; an opening flange (Figure 1, 12a) adapted for engagement with a chamfered tapered surface of a whole peripheral edge of one of said wafers on the side of said surface area thereof.

4. With respect to claim 2, the opening flange of each of said wafer holders is adapted to contact only with the chamfered tapered face of the whole peripheral edge of one of said wafers on the side of said surface area thereof which is subject to epitaxial growth.

5. However, while Suzuki discloses alternative arrangements (Figures 3, 5, 6, 8, 9) for the wafer holders within the reaction chamber, Suzuki fails to disclose wafer holders that are adapted to arrange said pair of wafers in such a manner that the wafers are disposed in mutually opposing positions with each said surface area adjacent to and parallel with each other so that a reaction chamber is formed

Art Unit: 1763

between said wafers. With respect to claim 5, Suzuki further fails to disclose said pair of wafer holders are adapted for vertical arrangement of said pair of semiconductor wafers so that the wafers are placed upright with each wafer surface vertically arranged.

6. Minagawa discloses a vapor epitaxial growth device and method comprising a pair of wafer holders arranged in such a manner that the wafers are disposed in mutually opposing positions with each said surface area adjacent to and parallel with each other so that a reaction chamber is formed between said wafers for the purpose processing two or more substrates at one time, preventing foreign objects from adhering to the surfaces of the wafers, lessening floor space used and efficiently using material gas (problem to be solved, solution).

7. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a pair of wafer holders arranged in such a manner that the wafers are disposed in mutually opposing positions with each said surface area adjacent to and parallel with each other so that a reaction chamber is formed between said wafers in Suzuki in order to process two or more substrates at one time, prevent foreign objects from adhering to the surfaces of the wafers, lessen floor space used and efficiently use material gas as taught by Minagawa.

8. Suzuki further fails to disclose a plurality of jaws for detachably engaging with an outer periphery of one of the wafers on a back surface side of said surface area thereof.

9. Selbrede discloses a plurality of jaw means/flexible wafer supports (23, 25) for detachably engaging with an outer periphery of the wafer on a back surface side of said surface area for the purpose of supporting a wafer (27) during processing (column 5, rows 41-44) with minimal contact area (column 5, rows 52-54).

10. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a plurality of jaws for detachably engaging with an outer periphery of the wafer on a back surface side of said surface area in Suzuki in order to support a wafer during processing with minimal contact area as taught by Selbrede.

Art Unit: 1763

11. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki, Minagawa and Selbrede as applied to claims 1 and 2 above, and further in view of U.S. Patent No. 5,458,322 to Kulkaski et al.

12. Suzuki, Minagawa and Selbrede disclose the invention substantially as claimed and as described above.

13. However, the prior art fails to disclose that the jaws further comprise a plurality of springs for respectively thrusting each said jaws toward a center of said opening, and detachable actuating means for locking of said jaws in a released position against respective thrust forces from said springs.

14. Kulkaski et al. disclose jaws with springs (Figures 1-3,13) and detachable actuating means (31; column 3, rows 57-65) for locking each jaw in a released position against the thrust force from said springs means for the purpose of installing and removing a substrate from the jaws.

15. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided spring means and detachable actuating means in the prior art in order to install and remove substrates from jaw means as taught by Kulkaski et al.

16. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki, Minigawa and Selbrede as applied to claims 1 and 2 above, and further in view of European Patent Application No. 840 358 to Balance et al.

17. Suzuki, Minigawa and Selbrede disclose the invention substantially as claimed and as described above.

18. However, the prior art fails to disclose an inclined face corresponding to the edge of the wafer on said back surface side thereof.

19. Balance et al. disclose a sloped substrate support for the purpose of reducing the effect and severity of scratches on the substrate caused by the support thereby improving substrate yield (abstract).

20. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have included an inclined face corresponding to the edge of the wafer on said back surface

Art Unit: 1763

side thereof in the prior art in order to reduce the effect and severity of scratches on a substrate caused by the support thereby improving the substrate yield, as taught by Balance et al.

Response to Arguments


20. Applicant's arguments with respect to claims 1-4 have been considered but are moot in view of the new ground(s) of rejection. New art has been cited to address the limitation of the wafer holders being parallel and vertical and forming a reaction space between the two holders. Examiner notes Applicant's argument regarding the inability of the apparatus of Suzuki to be heated from the backside. However, while the present claims call for heating of the substrate, no recitations are present regarding the structure or location of the heating mechanism. As claimed, the apparatus of Suzuki is capable of heating the substrate.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karla Moore whose telephone number is 703.305.3142. The examiner can normally be reached on Monday-Friday, 8:30am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on 703.308.1633. The fax phone numbers for the organization where this application or proceeding is assigned are 703.872.9310 for regular communications and 703.872.9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.308.0661.

km
January 24, 2003


BENJAMIN L. UTECH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700